

NOTES ON A COLLECTION OF CHITONS (POLYPLACOPHORA)
FROM THE CAPRICORN GROUP, QUEENSLAND.

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PLATE XII. (in part).

Mr. W. J. Kimber has placed in my hands for description a very interesting collection of chitons made by himself during his recent visit to the Capricorn Group. While it is not a large collection, containing altogether representatives of eight species and subspecies, two of which are new, it very considerably extends the range of several, and enables one to note characters previously unrecorded in one or two little known forms.

Family ACANTHOCHITONIDAE, Hedley, 1916.

Subfamily CRYPTOPLACINAE, Thiele, 1910.

Genus *Cryptoplax*, Blainville, 1818.

CRYPTOPLAX OCVLATUS, Quoy and Gaimard.

Chiton oculatus, Q. and G. (Voy. "Astrol," Zool., iii, p. 410, t. 73, f. 37, 38, 1834).

There are two examples of this *Cryptoplax* in the collection, both in excellent condition except for some erosion on the valves; both are curled, but the length if straight I should judge to be about 40 mm. The "hair-tufts," or what correspond with these in the genus *Acanthochiton*, are clearly marked and placed at the sutures, seven on each side and four in front of the anterior valve, the spicules in each of these tufts being white. Iredale and Hull (Austr. Zool., vol. 4, pt. 2, pp. 101-4, 1925) state that in their opinion this species is conspecific with *Chiton larvaeformis*, Burrow. I have in my collection an example of *C. oculatus* from Sulu, given to me by Major Dupuis, and another from an island north of Australia, given to me by Dr. J. Thiele, of Berlin; these are certainly conspecific with those collected by Mr. Kimber in the Capricorn Group. I have also two examples of *Cryptoplax larvaeformis* from Tonga Tabu given to me by Major Dupuis; the girdle clothing of these is very different from the examples of *C. oculatus*. On the evidence before me, I could not think of following Iredale and Hull in lumping the two species together.

Family ISCHNOCHITONIDAE, Pilsbry, 1892.

Subfamily CALLISTOPLACINAE, Pilsbry, 1892.

(If the genus *Callistoplax*, Cpr., 1882, should be removed from this subfamily, the subfamily name would be altered to CALLISTOCHITONIDAE.)

Genus *Callistochiton*, Carpenter, 1882.

CALLISTOCHITON ANTIQVUS PERIOVISA, Ire. and Hull, 1925.

(*Callistelasma periousia*, Iredale and Hull, Austr. Zool., iii, 1925, 333, pl. xl., f. 8, North Queensland.)

The following is the author's definition:—"Distinguishable from *C. antiqua* by the distinctly annulate character of the nodules on the ridges of the lateral areas; the consistently broader posterior ridge; the more numerous (13 on each side) longitudinal lines in the central areas; the fine latticing so characteristic of the southern shell is present." I would add to the above, that the longitudinal

ribbing of the pleural area is shallower than *C. antiquus* and evenly nodulose, giving a granulose appearance to the ribs that is wanting in *C. antiquus*.

The girdle scales are identical with those of *antiquus* and similarly placed diagonally across the girdle. This is certainly a good subspecies, the differences being modifications of the sculpture of *antiquus*, but I cannot feel justified in allowing it full specific rank. There were several examples in the collection preserved in spirit, and, unfortunately, in several cases the valves had become detached.

CALLISTOCHITON GENEROS, Iredale and Hull, 1925.

Pl. xii, fig. 2.

(*Callistelasma generos*, Iredale and Hull, *l.c.*, f. 3, 4.)

The type was from the Capricorn Group, discovered by Hedley; in the collection under review is one dry specimen, curled, but in excellent condition, and also a nice series of curled examples preserved in spirit. The type description states "anterior valve ten-ribbed, ribs obsolete nodulose, interstices roughly pustulose." In the example before me, in addition to the ten ray-ribs mentioned, the posterior margins of the valve are also ridged; this is shown in the figure, but in this specimen the ribs are bridged across the interstices and not pustulose, as stated in the description. Since making the foregoing note I have been able to confirm it with other specimens, and find that this feature of bridging, *i.e.*, small ridges connecting the ray-ribs, seems to be consistent but variable in degree, sometimes shallow, in other places coarse. In the median valve I also notice differences from the type description which reads as follows: "Lateral areas two-ribbed, the anterior one duplicating, subnodulose; posterior one with a succeeding line of obscure pustules." In the examples before me the duplication of the anterior rib is not consistent, the two ribs are distinctly bridged across as in the anterior valve, the posterior margin is strongly serrate, this latter constituting a striking feature in all the specimens; the statement in the description that the "jugal tract is minutely pustulose" is correct, but the added words (almost smooth) are somewhat misleading, for under 62 mag. this decussate sculpture is seen to be very sharp, and although minute, deeply cut. In the posterior valve the bridging also exists, but the mucro in the example before me is very distinct like a small pyramid; in this form, in common with other species of chitons, there is a good deal of variability both in the elevation and position of the mucro. The girdle is described as follows: "Girdle broad, scales very small, elongate, regular, 8-grooved." I should take exception to the term "very small," as compared with the scales of, say, *Ischnochiton atkinsoni*, Iredale and May, they are decidedly larger; in common with most chitons the scales near the outer edge are almost minute and increase rapidly towards the shell. The word elongate requires qualification, for these exceptionally beautiful, glassy scales are very short in the direction of the tegmentum, but laterally are very elongate, and an almost unique feature is overlooked in the type description in that the scales are sharply curved over both towards the tegmentum and towards the base, the unusually deep grooving on the scales is easily discerned with a pocket lens of 20. mag., and this easily distinguishes this species from any other Australian *Callistochiton*. Messrs. Iredale and Hull propose a new genus *Callistelasma* for the reception of all Australian *Callistochitons*, but do not attempt to compare them with what they consider to be the true *Callistochitons* or to show which are the divergent features upon which they desire to justify the proposal; under these circumstances, I do not consider we are justified in adopting their proposed new genus.

Genus *Lophochiton*, Ashby, 1923.

LOPHOCHITON GRANIFER, Hull, 1923.

(*Callistochiton granifer*, Hull, Austr. Zool., 1923, 161, pl. xxv., f. 5-8.)

One small example of this beautifully decorated species was secured. The genus *Lophochiton* was proposed by myself in 1923 because the small shell from Shark Bay, Western Australia, which I named *Lophochiton johnstoni*, was without festooning in the insertion plates and is probably intermediate between the genus *Ischnochiton* and that of *Callistochiton*, this Shark Bay species being the type of the genus *Lophochiton*. The relationship between *L. granifer*, *L. johnstoni*, *Chiton coccus*, Menke, *Callistochiton recens*, Thiele, *Solivaga recens*, of Iredale and Hull, will be dealt with in another paper.

Family CHITONIDAE, Pilsbry, 1892.

Subfamily CHITONINAE, Pilsbry, 1892.

Genus *Chiton*, Linne, 1758.Subgenus *Rhyssoplax*, Thiele, 1893.**Chiton (Rhyssoplax) excellens capricornensis**, n. subsp.

Pl. xii., figs. 1 and 13.

(*Rhyssoplax excellens*, Iredale and Hull, Austr. Zool., iv., 1926, 181, pl. xix., f. 22, 27, 40, Darnley Island, Torres Strait. Type, in Macleay Museum, Sydney. *Chiton pulcherrimus*, of Brazier, Proc. Linn. Soc. N.S. Wales, ii., 1877, 75, Iredale says not of Sowerby.)

Mr. Kimber has collected one example of a shell I am treating as a subspecies of the hitherto unique *Chiton excellens*; the specimen is dry and partly curled, measuring in this condition 14 x 9 mm. As above stated, if Iredale is correct in considering the Darnley Island specimen as non-conspecific with *C. pulcherrimus*, Sow., until this discovery of Mr. Kimber's, this species was only known from the single example in the Macleay Museum, and further, as shown later herein, if the drawings of Iredale and Hull are a correct expression of the sculpture of that shell, then the Capricorn example, although a near ally, is a distinct species, but without disarticulation and further investigation, I deem it wiser to treat it as a subspecies of *C. excellens*. This is certainly the most beautifully sculptured member of this genus.

Differentiation.—Instead of being "creamy-brown," the ground colour is creamy-white with bright-red blotches on six of the valves. The anterior valve in type is said to have "about 25 radiating, strongly nodulose ridges"; the specimen under review has 11, but between these has in one case 3 granules, in three cases 2 granules, and in two cases 1 granule, these being placed close to the girdle; these isolated granules on the outer margin may constitute vestiges of six out of the fourteen missing ribs, as the shell is in perfect condition the absence of these may be considered a racial character. In the median valve of type the lateral areas are said to have "3 bold nodulose ridges"; in this example the two outer ribs are bold, but the central one is only half the size, and varies from half to two-thirds the length; this sculpture in their figure 27 is different from the description, and in this respect corresponds more closely with the Capricorn shell; in the type description of the longitudinal ridges or ribs of the pleural area it is stated that "transverse ridges link up these longitudinals which are sharply nodulose." In the Capricorn shell the "longitudinal ridges" are not sharply nodulose, but all the 13 or 14 longitudinal ridges, except the two, in one case three, short outer ridges near the girdle are numerous bridged across, forming a coarse network pattern over fully two-thirds of this area; there is not the slightest evidence of this sculpture in their figure 40, which is drawn to a large scale with the object of expressing the sculpture of this particular portion

of the shell. If this fig. 40 is in any degree correctly drawn, then the shell from the Capricorn Group is certainly an altogether new species, and will constitute the third species of the *pulcherrimus* group.

Chiton (*Rhyssoplax*) kimberi, n. sp.

Pl. xii., figs. 10-12.

In the collection made by Mr. Kimber was a single example of a chiton that in outward appearance resembled the subgenus of *Ischnochiton* known as *Haploplax*, having the broadly-elliptical shape so common in *H. lentiginosus*, Sow., but rather flatter, surface without sculpture, girdle scales large and polished, but on disarticulation one was astonished to find that it belonged to the subgenus of *Chiton* s.s., and was closely related to *Chiton* (*Rhyssoplax*) *translucens*.

General appearance.—Broadly elliptical, anteriorly and posteriorly almost equally broad; colour after being in spirit "Tea Green" (Ridgway's Colour Standards, pl. xlvii.), girdle faintly banded with "Light Olive-Grey" (*l.c.*, pl. li.), shell faintly and broadly streaked and mottled with slightly darker markings, surface of shell smooth and polished, under simple lense of 20 mag. uniformly covered with faint decussate pattern, but sculpture almost if not entirely absent. lateral area raised; girdle scales very large and strongly grooved.

Anterior valve.—Measures 5.5 x 2.75 mm., is broad and shallow, unsculptured under 20 mag. except for a few broken, subobsolete growth grooves, slits 8, insertion plate beautifully and finely serrate.

Tail valve.—Measures 5 mm. x 3 mm., elevation very shallow, mucro at the anterior third, defined but not raised, the portion in front of mucro very small but shows five short, longitudinal grooves corresponding with those in the pleural areas of median valves, portion behind the mucro flat and concave, decussate pattern only perceptible under 20 mag., slits 11, insertion serrate as in anterior valve, angle of divergence 130°.

Median valve.—Measures 6.5 x 2.5 mm., lateral area indicated by a shallow, diagonal fold, and with lateral lighting, six longitudinal grooves are easily perceived crossing the pleural area, otherwise the valve under 20 mag. is unsculptured, the tegmentum is longitudinally very short but very broad laterally, elevation very shallow, the anterior and posterior margins of the tegmentum almost straight, beak subobsolete, sutural laminae broad, sinus between serrate along edge of articulation only, the same as in *translucens*, slit in each side, edge of teeth serrate.

Whole shell measures 14.5 mm. x 10 mm., but is slightly curved and very flat, not carinated but arched.

Girdle.—Very wide, where uncurled measures 2.5 mm. wide, and therefore occupies one-third of the total width of animal, is under a simple lens clothed with large, smooth, polished scales, but under 62 mag. the scales are seen to be decorated with widely spaced, very shallow and narrow ridges, the interspaces being wide and flat.

Body.—The gills appear to have extended the whole length of the body, but this could not be accurately determined, foot when dry measures 8 mm. in length, and head in proportion distinctly large.

Comparisons with C. translucens.—*Translucens* is an elongated shell, *kimberi* is a broad one, *translucens* is a strongly elevated shell, *kimberi* very flat; the specimen of *translucens* of which three valves are figured, measured before disarticulation 23.5 mm. x 10.5 mm., as compared with *kimberi* 14.6 mm. x 10 mm., so that they were both practically of an equal width, although so different in length; the median valve figured of *translucens* is between two and three times the elevation of *kimberi*, the

angles of divergence, *kimberi* 130°, *translucens* 90°, the sutural sinus is nearly double the width in *kimberi*, the tegmentum of the median valve slopes strongly forward in *translucens*, but is almost straight in *kimberi*, the minute decussate sculpture of *translucens* is practically absent in *kimberi*, although a minute decussate pattern is present, the grooving in the pleural area extends right across that area in *kimberi*, but is faint and grooves shorter in *translucens*, the beak which is a marked feature in *translucens* is obsolete to subobsolete in *kimberi*. I have pleasure in naming this interesting form after my friend Mr. W. J. Kimber, the discoverer, and to whose earnest collecting we are indebted for this opportunity of adding to our knowledge of several of the little known species dealt with in this paper.

Subfamily LIOLOPHURINAE, Pilsbry, 1893.

Genus *Acanthopleura*, Guilding, 1829.

ACANTHOPLEURA GEMMATA, Blainville, 1825.

Pl. xii., figs. 6, 7.

(*Chiton gemmatus*, Blainville, Dict. Sci. Nat. (Levrault), xxxvi., 1825, 544. *Acanthopleura gemmatus queenslandica*, Ashby, Journ. Proc. Roy. Soc. W. Austr., vol. viii., pp. 29-31, 1921-2.)

Ashby, in "Notes on the Australian Representatives of the genus *Acanthopleura* (*l.c.*), pointed out that the shell known in Australia as *A. gemmatus*, Bl., was not conspecific with *A. spinigera*, Sow., and also showed that it could not be referred to Pilsbry's subgenus *Amphitomura*, comparing it with topotypes of Pilsbry's type species, in his own collection. He then showed that examples from Dunk Island, Queensland, possessed a very different insertion plate from examples of *A. gemmatus*, from Maud's Landing in Western Australia, and suggested the subspecific name of *queenslandica* for the Dunk Island shell, with its short, laminated insertion plates in the end valves, especially the tail valve. Iredale and Hull consider the Dunk Island form conspecific with Blainville's shell, treating *queenslandica* as a synonym, giving the habitat for *gemmatus* as extending from Port Curtis, Queensland, in the east, to Bunbury, in South-western Australia. I have, personally, seen no examples taken south of a point between Carnarvon and Maud's Landing, north of Shark Bay, and should hesitate to accept Iredale and Hull's extension of the range 600 to 700 miles further southwards, without the presentation of supporting data.

The same gentlemen propose a new genus, *Acanthozostera*, for the reception of *gemmatus*, Blainville, but the definitions given are certainly below generic values; in fact, I cannot see that those advanced even justify subgeneric valuation. If the length of the teeth of the insertion plate is to be the chief ground of separation, then the western shell from Maud's Landing would have to be placed in a different genus to that of the Dunk Island shells, which seems absurd.

To quote Iredale and Hull (*l.c.*, p. 127) in their definition of the genus *Acanthopleura*: "The long teeth of the insertion plate in the anterior valve, more than half the length of the tegmentum, and the slitting (more than one) of the median valves, characterise this group (*Acanthopleura*) internally," as compared with their proposed new genus founded mainly on the shorter teeth and single slitting in the median valves. An example of *Acanthopleura spinosa*, Brug., now before me shows only one slit in median valve; it will thus be seen that the form from Maud's Landing, with its long teeth and single slit median insertion, is certainly a typical *Acanthopleura*.

Without attempting to settle the question as to which form Blainville described, or to again review the genus *Acanthopleura*, with its three sections or subspecies, proposed by Pilsbry, *viz.*, *Amphitomura*, *Mesotomura*, and *Maugeria*, which were fully discussed in paper quoted, I propose, subject to future revision, to accept Iredale and Hull's statement that the Dunk Island shell is conspecific

with Blainville's type, which is lost. I was given to understand that it was in Blainville's own private collection, which has been dissipated. I therefore indicate (subject to more accurate evidence being forthcoming) that Dunk Island is the type locality of *Chiton gemmatus*, Blainville, and now figure the end valves of type of my var. *queenslandica* as a neotype of *gemmata*, Blainville. Mr. Kimber has placed in my hands two examples from the Capricorn Group.

***Acanthopleura gemmatus maudensis*, n. subsp.**

Pl. xii., figs. 8, 9.

The acceptance of the eastern form as typical *Chiton gemmatus*, Blainville, makes it necessary to give a name to the Maud's Landing shell. I propose to name it after the locality from which my type example has come, but until sufficient material is available from various localities along the almost untouched immense stretch of coast line along the northern shores of the continent, I suggest that it be treated as a subspecies only, although it admittedly differs in a marked degree from the eastern form.

DEFINITIONS.

Anterior valve.—Insertion plate is very broad, teeth 2.5 mm. in length, irregular, slits 12, well defined and carried to the tegmentum on the outside, but on the inside showing only for one-fifth of the length of the teeth, the teeth are almost vertical, deeply and numerous grooved on the outside, the ridges between are strong and solid, colour pale greenish-blue. In Ashby's type of his *A. gemmata queenslandica*, which will now be the pleisotype of *A. gemmatus* s.s., the teeth are very short, in front 1 mm. in length, but increasing abruptly to slightly over 1.5 mm. at each side, slits very indistinct (I count 10), teeth denticulate at the edge, the grooves on the outside are seemingly deeper, but the ridges between are thin and more widely spaced, the insertion plate protrudes forward not almost vertical as in *maudensis*, colour of insertion brown.

Median valve.—In both forms slit 1/1, teeth grooved, colour in *maudensis* brown, shading in the sutural laminae to a bluish tinge, in the Dunk Island shell dark brown.

Tail valve.—In *maudensis*, insertion plate very broad, teeth behind mucro 2.75 mm., increasing laterally to 3.5 mm. in length, slits 9 and 2 subobsolete ones, teeth strongly serrate, the slits on the outside are carried to the tegmentum but on the inside extremely shallow, even more so than in the anterior valve, the grooving is carried up to the tegmentum but the ridges between are broader and stronger than in the anterior valve, the most marked feature is the acute angle at which the insertion plate bends forward, as near as I can measure it, is at an angle of 70°, colour of insertion plate is greenish-blue. In *A. gemmata*, the Dunk Island shell, the insertion plate is short, slits 8, continued to the tegmentum on the outside, shallow and just showing on the inside, teeth 1 mm. in length, not directed forward as in *maudensis* but although nearly vertical, bend slightly outwards, the grooves in the outside of the teeth are much more deeply cut and the ridges between comparatively thin, like lamina, and standing up well above the callousing of the inside, altogether strikingly different from *maudensis*, the colour of the insertion plate is brown.

Genus *Tonicia*, Gray, 1847.

Subgenus *Lucilina*, Dall., 1881.

TONICIA (LUCILINA) SHIRLEYI, Iredale, 1914.

(*Lucilina shirleyi*, Iredale, a new name for *Chiton pictus*, Reeve, Proc. Mal. Soc. Lond., xi., 1914, p. 131.)

Until Mr. Hull started his collecting trips up the Queensland coast, this shell was only known from three or four examples; one of these, from the collection

of the late Dr. Shirley, was sent to London, and in 1922 was handed to me to return to Shirley, but on reaching Australia I learned with deep regret that he had died during my absence, and Mrs. Shirley very generously gave me this example and a few other chitons that I had become possessed of on Dr. Shirley's behalf. Since then Hull has collected this species up the Queensland coast in considerable numbers, and he is to be congratulated on having thrown so much light on the chiton fauna of that hitherto much neglected region.

Mr. Kimber has collected two dozen specimens of this shell in the Capricorn Group. I have compared them with the shell from Bundaberg, collected by Dr. Shirley, and with two others given to me by Mr. Basset Hull from the Whitsunday Group. While the collection before me show considerable variation amongst the individuals, they are undoubtedly referable to this form. In the writer's paper "Notes on the types of Australasian Polyplacophora in the British Museum" (Trans. Roy. Soc. S. Austr., vol. xlviii., 1924), he suggested that all the Australian representatives of this genus were probably referable to three species, *T. fortulirata*, *T. shirleyi*, and *T. hullianus*; Iredale and Hull recognise three more, *T. rainfordiana*, *T. dilecta*, and *T. carpenteri*. There is no question that members of this genus vary to a large degree in the same species, from smooth to highly sculptured specimens, and until a larger series from a number of localities is available, and more intensive work has been done in this group, I should hesitate to accept the six as good species, but am not in a position to express a considered opinion.

For description of figures on pl. xii. (in part), see description of
pl. xii. at the end of the next following paper.
